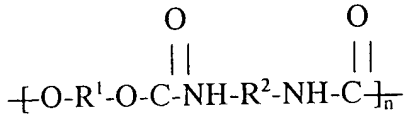
What is claimed is:

1. A composite structure with at least one polyurethane layer, a support layer, and an optional adhesive layer placed between these layers, wherein at least one polyurethane layer contains a polyurethane having the formula (I)



(I)

wherein O-R^1-O- is the radical of a polyole with primary and/or secondary hydroxyl functional end groups,
R^1 and R^2 independently represent an organic radical which includes aliphatic, cyclo-aliphatic, aromatic and/or heterocyclic groups, and
n is an integer number between 1 and 50,000.

2. The composite structure according to claim 1, wherein the at least one polyurethane layers comprises two polyurethane layers and wherein the outer and/or the inner polyurethane layer include a polyurethane of the formula (I).

3. The composite structure according to claim 2, wherein the polyole has a molecular weight from approximately 2000 to approximately 12,000.

4. The composite structure according to claim 1, wherein the polyole is a polyether glycol and/or a polyester glycol.

5. The composite structure according to claim 4, wherein the polyether glycol is a poly-(oxypropylene) glycol and the polyester glycol comprises glycols of dimeric fatty acids.

6. The composite structure according to claim 5, wherein the primary and secondary hydroxyl functional groups of the polyole have a ratio of between approximately 2:1 and 1:6.

7. The composite structure according to claim 6, wherein the polyole is bi-functional and/or tri-functional.

8. The composite structure according to claim 7, wherein the ratio of the bi-functional polyoles to the tri-functional polyoles is between approximately 1:2 and approximately 5:1.

9. The composite structure according to claim 8, wherein in that the radical R^2 is based on isophoron diisocyanate and/or hexamethylene diisocyanate.

10. The composite structure according to claim 8, wherein the radical R^2 is based on diphenylmethane diisocyanate (MDI) and/or toluylene diisocyanate.

11. The composite structure according claim 10, wherein that the polyurethane layer(s) which contain(s) the polyurethane according to formula (I), have/has a solid content of at least approximately 95%.

12. The composite structure according to claim 11, wherein the polyurethane layer(s) which contain(s) the polyurethane according to formula (I), have/has a thickness of approximately 0.2 mm to 0.5 mm.

13. The composite structure according to claim 12, wherein the polyurethane layer(s) which contain(s) the polyurethane according to formula (I), have/has a density of approximately 0.3 g/ml to 0.8 g/ml.

14. The composite structure according to claim 13, wherein the polyurethane layers which contain the polyurethane according to formula (I) have a content of volatile organic chemicals (VOC) below approximately 100 ppm.

15. The composite structure according to claim 14, wherein the composite structure has a grain.

16. A method of producing a composite structure comprising the steps of:

a) applying at least one polyurethane layer to a support having dehesive properties, forming the at least one polyurethane layer by spreading onto a tape or onto a polyurethane coating, which is preformed on the tape, a reactive spreadable material capable of forming a polyurethane and having a composition (A) which includes

i) a polyole HO-R^1-OH with primary and/or secondary terminal hydroxyl functionalities,

ii) a diisocyanate OCN-R^2-NCO and/or a diisocyanate pre-polymer OCN-R^2-NH-CO-O-R^1-O-CO-NH-R^2-NCO, wherein R^1 and R^2 independently represent an organic radical which comprises aliphatic, cyclo-aliphatic, aromatic and/or heterocyclic groups, and

iii) a catalyst,

and thermally hardening the spread compound;

b) applying an adhesive layer on the hardened polyurethane layer;

c) applying a textile support layer on the side facing away from the tape, and

d) removing the composite structure from the tape, after the adhesive layer has hardened.

17. The method according to claim 16, wherein the at least on e polyurethane layer is two polyurethane layers and wherein the outer and/or the inner polyurethane layer is formed by using a reactive spreadable material having a composition (A) and being capable of forming a polyurethane.

18. The method according to claim 17, wherein a metal acetyl acetonate is used as a catalyst.

19. The method according to claim 17, wherein nickel acetyl acetonate is used as a catalyst.

20. The method according to claim 16, further comprising the step of employing a reactive spreadable material having the composition (A) and being capable of forming a polyurethane, with the spreadable material having a viscosity in the range from approximately 1 Pa s to approximately 20 Pa s during spreading.

21. The method according to claim 20, wherein the time period during which the viscosity of the reactive spreadable material having the composition (A) and being capable of forming a polyurethane is in the range from approximately 1 Pa s to approximately 20 Pa s (open time), is greater than approximately 6 hours.

22. The method according to claim 16, further comprising the step of employing a reactive spreadable material having the composition (A) and being capable of forming a polyurethane, with the spreadable material having structural-viscous properties.

23. The method according to claim 16, wherein the thermal hardening step is carried out over a time period of approximately 0.1 to 4 minutes at approximately 100 to 180°C.

24. The method according to claim 23, wherein the thermal hardening step is carried out over a time period of approximately 90 to 150 seconds at approximately 145 to 155°C.

25. The method according to claim 16, wherein a support with dehesive characteristic properties is used, with the support having a negative of a desired grain.

26. An imitation leather manufactured according to the method of claim 16..

27. An expanded foil manufactured according to the method of claim 16.

28. The composite structure according to claim 1, wherein the support layer is a textile layer.

29. The composite structure according to claim 1, wherein the support layer is made of PVC.

30. The composite structure according to claim 1, wherein the support layer is made of polyolefine.

31. The composite structure according to claim 1, wherein the support layer is made of polyurethane foam.